



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Art Unit 2411 FEB 19 1997
BOARD OF PATENT APPEALS
AND INTERFERENCES

In re Application of
Vanderwende et al.

Application No. 08/227,247

Filed: April 13, 1994

For: METHOD AND SYSTEM FOR
COMPILING A LEXICAL
KNOWLEDGE BASE USING
BACKWARDS-LINKING
NATURAL LANGUAGE
PROCESSING (As Amended)

Examiner: R. Weinhardt

Date: February 4, 1997

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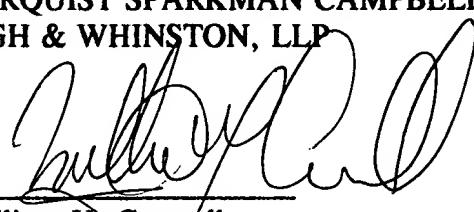
Sir:

Enclosed are triplicate copies of Appellants' Reply Brief in the captioned matter.

Please charge any fees that may be due in connection with this paper to Deposit Account
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Respectfully submitted,

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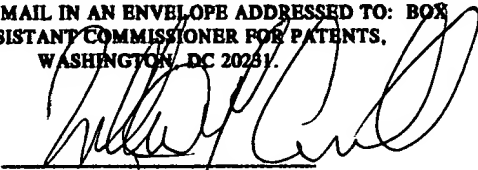
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REPLY BRIEF

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Sir:

This Reply Brief is responsive to the Examiner's Answer mailed December 5,

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I. INTRODUCTION

The Examiner's Answer compounds the errors of the Final Rejection.

1. The Examiner Erred by Dismissing (as "Irrelevant") Contrary Teachings in the Applied Art

After considering the 1990, 1991, and 1995 Lenat articles submitted with Appellant's Brief, the Examiner has apparently withdrawn his argument that Lenat's forceful teachings away from Appellant's invention were an outdated, 1970's-era assessment. Now he simply dismisses Lenat's contrary teachings as "irrelevant." In so doing, the Examiner has violated the rule requiring that the cited art be considered for *all* it teaches, including contrary teachings. Such contrary teachings are strong evidence of the claims' *non-obviousness*.

2. The Answer Improperly Applied New Art

The Answer says it does not contain any new ground of rejection, but in fact it contains many.

Prior efforts by Chodorow, Markowitz, Calzolari, Jensen/Binot, Klavans, Ravin, Verlardi, and Montemagni/Vanderwende are all relied on in the Answer as

supporting various obviousness rejections.¹ Yet not one of these references was cited previously in prosecution.

If the Examiner believes this newly-cited art supports any rejection, he can reopen prosecution. Introduction of such art for the first time in the Answer is improper. (Moreover, the art and arguments newly advanced in the Answer are fatally flawed.)

3. The Answer Failed to Address Numerous Other Points, Requiring Reversal

The Answer failed to address numerous points raised in the Appeal Brief. The Examiner's tacit concessions on these points are further grounds compelling allowance of the claims.

II. THE ANSWER ERRONEOUSLY DISMISSED LENAT'S CONTRARY TEACHINGS

This case presents an anomalous situation: a reference relied on by the Office (Lenat) *explicitly* and *directly* teaches away from appellants' claimed combinations.²

During prosecution, the Office discounted these contrary teachings, arguing that they dated from "the early seventies" and had doubtless been superseded by the

¹ Answer at pages 7-8.

² Appeal Brief at pages 14-18.

advance of technology.³ But Appellants' Brief showed that Lenat continued urging these same contrary teachings through a series of subsequent publications, *as recently as 1995*.⁴

1. Lenat's Contrary Teachings Are Not "Irrelevant"

In the Answer, the Examiner retreated from his earlier assertions that Lenat's contrary teachings are an outdated assessment.⁵ Instead, he now terms such Lenat teachings "irrelevant":

With respect to the Lenat et al. reference, appellant goes to great lengths to demonstrate that Lenat rejected the automated approach to building a database through natural language analysis. Whether or not this is so is irrelevant...⁶

The teachings of the prior art are never irrelevant.

The teachings of the prior art are particularly relevant in this case. They teach adamantly away from the claimed combination. They are found in art on which the Examiner relies. And they are statements by an authority preeminent in the field.

³ Paper 7, page 5, last paragraph.

⁴ Appellants' Brief at pages 14-20.

⁵ This ground is still parroted from the Final Rejection, however, in the Grounds of Rejection section of the Examiner's Answer. (Answer, page 6, last paragraph).

⁶ Examiner's Answer, page 10, last paragraph.

Precedent is abundant that contrary teaching in the art is an important indicium of non-obviousness.⁷ Such teaching goes directly to the pivotal issue of whether the prior art would have suggested the claimed process, and its reasonable likelihood of success. Dismissing teachings of the cited art as "irrelevant" is clear error.

2. Lenat's Expertise Does Not Render His Teachings "Irrelevant"

The Answer next seeks to belittle Lenat and his views as not those of one ordinarily skilled in the art.

First, it is unchallenged that Lenat is an expert in this field.⁸ An invention that is non-obvious to an expert is, more so, non-obvious to one of ordinary skill.

Second, the Examiner's implicit argument that an "expert" may be blind to the "obvious" has been tried and rejected before. In a similar case challenging the contrary opinion of an expert as not being "one of ordinary skill in the art," the Federal Circuit in *In re Dow Chemical* observed:

⁷ *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531-32 (Fed. Cir. 1988); *In re Bell*, 26 USPQ2d 1529, 1532 (Fed. Cir. 1993); *In re Gurley*, 31 USPQ2d 1130, 1132-33 (Fed. Cir. 1994).

⁸ A frontispiece in the cited Lenat book *Building Large Knowledge-Based Systems* lists four other McGraw-Hill and Addison-Wesley texts authored by Lenat. *See also* Appeal Brief at page 14.

[T]he Commissioner argues that even though an expert polymer scientist, Dr. Keskkula, "personally may have been surprised by the invention at the time it was made, it does not necessarily follow that the invention would have been obvious to one of ordinary skill in the art." The Commissioner suggests that one less encumbered by knowledge of the need for phase inversion, as described in the Molau/Keskkula article, might have achieved the Dow product by combining the references in the way suggested by the Commissioner. Reflecting on this theory of invention, we observe that such a person did not do so, despite the decades of experimentation with these components, and the recognition of need.⁹

So, too, in the present case. That appellants' invention was not obvious to "one less encumbered by" expertise is evident from the facts. The Answer applies art going back to 1989 (Lenat book) and to 1985 (Chodorow paper, newly cited in Answer). Yet despite tremendous efforts made in the Artificial Intelligence field in the intervening years, no one but appellants made the combinations claimed. (And the need for the solution achieved by appellants has been recognized even longer as evidenced, e.g., by statements in landmark computer science works -- from 1961 and 1950 -- cited in Appellant's Brief on page 14).

Like *Dow*, the tradition of diligent work in the field, coupled with the longstanding recognition of need, confirms the conclusion of non-obviousness indicated by expert Lenat's contrary teachings.

⁹ *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1532 (Fed. Cir. 1988).

3. The Examiner Impermissibly Disregarded Lenat's Explicit Teachings In Favor of His Own Hindsight

Both the suggestion to combine, and the expectation of success, must be found in the prior art if the Examiner's burden is to be met.¹⁰ Here there is neither. On both facts, the Examiner's hindsight was applied to the exclusion of the contrary teachings of the art.¹¹ This is error.

Lenat's teaching away is a *per se* demonstration of the lack of a *prima facie* case,¹² and requires reversal of the rejections.

III. THE ANSWER IMPROPERLY APPLIED NEW ART. AND A NEW RATIONALE, TO TRY AND ESTABLISH A PRIMA FACIE CASE

The Answer identifies eight references, for the first time, as allegedly supporting the rejection. They are (1) Chodorow et al, (2) Markowitz, (3)

¹⁰ *Ibid.*

¹¹ Applicants raised the contrary teachings of Lenat during prosecution because the Examiner's rejection was based on Lenat. But Lenat was not alone in teaching away from applicants' approach. Dahlgren (1988) and Miller et al (1990), for example, similarly eschewed applicants' general approach in favor of the hand-coding of structured semantic knowledge. (Specification at page 1, lines 19-20.) Dahlgren and Miller et al were among the references *not* newly selected by the Examiner to support the rejection in the Answer.

The eight references newly relied on in the Answer also teach away from the claimed combinations. See, e.g., the discussions below (pages 12 - 15) concerning *string searching* versus *parsing*, and extraction by *syntactic analysis* versus extraction from *logical form*.

¹² *In re Dow Chemical, supra.*

Calzolari, (4) Jensen/Binot, (5) Klavans et al, (6) Ravin, (7) Verlardi, and (8) Montemagni/Vanderwende.¹³

Moreover, the Answer identifies a new portion of applicants' specification on which the Examiner relies as prior art.¹⁴

If the Examiner believes these newly-cited references support any rejection, he can reopen prosecution. Introduction of such art for the first time in the Answer is improper.¹⁵

1. The Eight New References Were Not Identified During Prosecution

Apart from the contrary-teaching Lenat book, the *only* citation to art *anywhere* during prosecution was the enigmatic reference:

"page 2, lines 9+, and page 10, lines 8+, of the instant specification"¹⁶

¹³ Answer at pages 7-8.

¹⁴ Discussed below at page 10.

¹⁵ The Examiner was invited to introduce such art by appellants' response to the First Action, which challenged the sufficiency of the original rejection. (The original rejection was explicitly made the basis for the final rejection (Paper 5, para. 5, page 4), notwithstanding appellants' cancellation therein of all the claims originally filed, and submission of different claims in their stead.)

¹⁶ Paper 4, second-to-last line.

The Examiner distilled this ambiguous reference into a single sentence "teaching" as follows:

Applicant's admitted prior art teach the parsing and extraction of semantic relation structures including a headword, a relation and a value from dictionaries and their storage in association with the headword for use as a knowledge base for natural language processing.

Applicants' specification reviewed the works of over *twenty* diverse research efforts. Over a dozen of these were referenced in the page and a half following "page 2, line 9."

In their Appeal Brief, appellants noted that the Examiner's phantom aggregation of elements, assembled from unknown contexts, combined according to the Examiner's personal view of "common sense," and distilled into a single-sentence "teaching," betrayed striking hindsight. It was in tacit acknowledgement of this failing that the Answer finally identified which of these references the Examiner relied on, and which -- implicitly -- he did not.

The Examiner could have identified these eight references in either the first or second (final) office actions. Journal articles corresponding to each of the research efforts reviewed in appellants' specification were submitted in an Information Disclosure Statement filed well before the first Action.

The Examiner's failure to earlier identify the references on which he now relies was error.

2. The Answer Identifies, and Relies Upon, a New Portion of Applicants' Specification as Prior Art

The Answer refers, *five* times, to statements made by applicants on page 8 of their specification.¹⁷ Each time, the Examiner relies on such statements as prior art supporting the rejection.

If the Examiner's citation, during prosecution, to "page 2, lines 9+" was *meant* to extend through page 8, it illustrates the ineffectiveness of the earlier citation.

If the Examiner's earlier citation was *not meant* to extend through page 8, then the new reliance on this page is a further new ground of rejection. Again, the Examiner's failure to earlier identify this basis for the rejection was error.

3. Reliance on Art Not Previously Cited is a New Ground of Rejection

Such identification of art for the first time in the Examiner's Answer, allegedly without raising a new ground of rejection, has previously been addressed and rejected by the Board. In a case factually similar to appellants', the Board noted:

The examiner has cited and relied upon four new references in the Examiner's Answer but did not make a new ground of rejection. As set forth in *In re Hoch*, 57 CCPA 1292, 428 F.2d 1341, 166 USPQ

¹⁷ Answer at page 8, second-to-last line; page 9, line 17; page 10, line 3; and page 12, lines 8 and 13.

406 (1970), "[W]hen a reference is relied on to support a rejection, whether or not in a 'minor capacity,' there would appear to be no excuse for not positively including the reference in the statement of rejection."¹⁸

So, too, here. If the Examiner relies on a reference (let alone eight references) to support a rejection in the Answer, there is no excuse for not having positively identified the reference in the rejection (or in prosecution).

The Board continued:

The failure of the examiner to do so here appears to be for the purpose of avoiding a new ground of rejection. Since a new ground of rejection was not made, appellants were not entitled as a matter of right to respond to this new evidence of obviousness by way of amendment and/or evidence. Rather, appellants were limited to presenting argument by way of a Reply Brief. The procedural disadvantage in which appellants were placed by the examiner's action is apparent.

So, too, here. Appellants are not now able to respond to the Examiner's new contentions in the manners to which they should be entitled. Their procedural disadvantage is equally apparent.

¹⁸ *Ex Parte Movva*, 31 USPQ2d 1027, 1029, fn. 2 (BdPatApp&Int 1993).

4. The New Rationale Proposed by the Examiner is Multiply and Fatally Flawed

Without waiving their entitlement to relief for the Examiner's improper introduction of new grounds/rationale for rejection in the Answer, appellants briefly address some of the errors in the Examiner's new analysis.¹⁹

A. The New Analysis Relies on Hindsight Rather Than Teachings of the Prior Art

One error is that the Answer's analysis of the eight newly-cited references impermissibly relies on appellants' specification -- rather than on prior art teachings - - as a guide to assembling the references.

The eight references newly cited in the Answer present teachings that can be combined in myriad ways. Each combination requires a decision not only of which elements from which references to *employ*, but also which elements to *modify*, and which elements to *disregard*.

Consider appellants' claim requirement that parsing is used to identify semantic relations with in a text.²⁰ Chodorow -- on which the Examiner newly relies -- does this by *string searching* -- an entirely different technique.²¹ Why was

¹⁹ The new analysis spans pages 7, 8, 9, 10, and 12.

²⁰ Appellants' preferred embodiment, and nearly all the appealed claims (save 30 and 35), operate in this way.

²¹ Specification at page 2, lines 14-16.

this contrary teaching of Chodorow selectively ignored? The Examiner gives no reason.

Chodorow wasn't alone in this respect. The Examiner also cited Markowitz, who followed Chodorow's approach.²² Why was this teaching of Markowitz ignored?

And Calzolari -- also newly cited by the Examiner -- likewise employed string searching.²³

Why was such a consistent theme in the newly-applied art summarily disregarded? No reason, except impermissible hindsight, is evident from the Answer.

This is but one example from many that may be drawn from the *disregarded* teachings of the newly applied art. Each spotlights the Examiner's unexplained selection of elements from the eight references to reject appellants' claims.

²² Specification at page 2, lines 16-20.

²³ Specification at page 2, lines 20-22.

Particularly when relying on a large number of references,²⁴ care must be taken to avoid a selective piecing together of the art.²⁵ The Examiner's new arguments violated this rule.

B. The Examiner Ignored the "Logical Form" Claim Limitations

Another error is that the Examiner entirely ignored the requirement of extracting semantic information by analysis of a "logical form"²⁶ -- a limitation found in most of the appealed claims.²⁷

The Examiner's single-sentence distillation of so-called "admitted prior art"²⁸ neglected this "logical form" limitation.²⁹

²⁴ Nine references, including Lenat.

²⁵ "At all costs, the mistake of picking random bits of various prior art references and employing them as a 'mosaic to recreate a facsimile of the claimed invention' must be avoided." *W.L. Gore*, 721 F.2d at 1552.

²⁶ In the preferred embodiment, parsing is employed to yield a syntactic structure. Then, in a *further* step, a set of logical rules is applied to the syntactic structure to produce a corresponding logical form. See specification at page 8, lines 5-16, and page 10, lines 8-20.

²⁷ This limitation is found in claims 20, 21, 24, 25, 26, 27, 28, 29, 33, 34, 42, 43, 44 and 45. Like other limitations of the claimed combinations, the "logical form" is not new *per se*. However, by ignoring the limitation entirely, the Examiner has failed to establish a *prima facie* case under § 103. Appellants cannot offer a reasoned rebuttal to a contention that Examiner failed to make.

²⁸ Answer, page 4, first sentence of second full paragraph. Also quoted on page 9, *supra*.

Appellants' specification emphasized that their use of the *logical form* was one of the distinguishing hallmarks of their preferred embodiment.³⁰ The specification went on to distinguish appellants' use of this logical form from the prior art's technique of extracting semantic relations by applying patterns/rules to syntactic information ("syntactic analysis").³¹ The specification continued to note that such use of the logical form reveals nuances of meanings not always apparent from the original text.³²

Finally, no logical form is cited from Lenat.

Even if the Board entertains the new grounds/rationale of rejection improperly raised for the first time in the Answer, the Examiner's failure to consider the "logical form" limitations, or to provide some rationale guiding an artisan in the selective piecing together of the nine references, requires reversal of the rejections.

²⁹ The Examiner's error is apparent throughout the Answer, including his criticism of the specification's statement (page 9, lines 7-8) explaining the shortcomings of the prior art. The Examiner incorrectly assumes, for example, that all parsing produces the logical form (Answer, page 9, line 18). It does not. It yields a syntactic structure. (Specification, page 8, lines 5-14.) As noted in note 26, above, appellants' preferred embodiment takes the *further* step of applying a set of logical rules to the syntactic structure to produce the logical form.

³⁰ Page 9, lines 7-8.

³¹ Page 10, lines 18-20. This prior art technique is employed in the prior art work of Jensen/Binot, and Montemagni/Vanderwende, as reviewed at page 2, line 24 through page 3, line 5 of appellants' specification.

³² Specification, page 21, lines 5-8.

IV. THE ANSWER TACITLY CONCEDES NUMEROUS POINTS REQUIRING REVERSAL

In their Appeal Brief, appellants identified eleven "bulleted" claim limitations that were never addressed in prosecution.³³

In the Answer, the Examiner identified prior art showing some of these elements, but in other contexts. A *prima facie* case is not made by such a showing.

To meet his initial burden, the Examiner was additionally required to propose a rationale that would have suggested, to an artisan, the combination of these elements in the manners claimed. For ten of the eleven claim limitations, the belated arguments in the Answer do not even attempt to provide such a showing.³⁴ Reversal of these rejections is thus required.

Finally, the Examiner does not contest (i.e. he tacitly concedes) that the invention meets a critical long-felt but unmet need.³⁵

In these points, too, the Answer fails to present a sustainable rejection.

³³ Appeal Brief, pages 22-24.

³⁴ The exception is what the Examiner terms "extraction of different sets of semantic relations," for which the Answer proposes a facially insufficient rationale. (Page 12, 5th line from the bottom).

³⁵ This point was raised repeatedly in the Appeal Brief, e.g. at page 4, lines 4-6; page 14, lines 3-6 ("the holy grail of artificial intelligence"); page 17, last paragraph; page 20, last sentence. Each was ignored by the Examiner.

V. CONCLUSION

The rejections of the appealed claims are erroneous in fact and law. Having not met his burden under § 103, the Examiner's rejections must be reversed.

Respectfully submitted,

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